PUGET SOUND ENERGY

Kitsap & Jefferson Counties Conservation Potential for BPA Non-Construction Alternatives Working Group

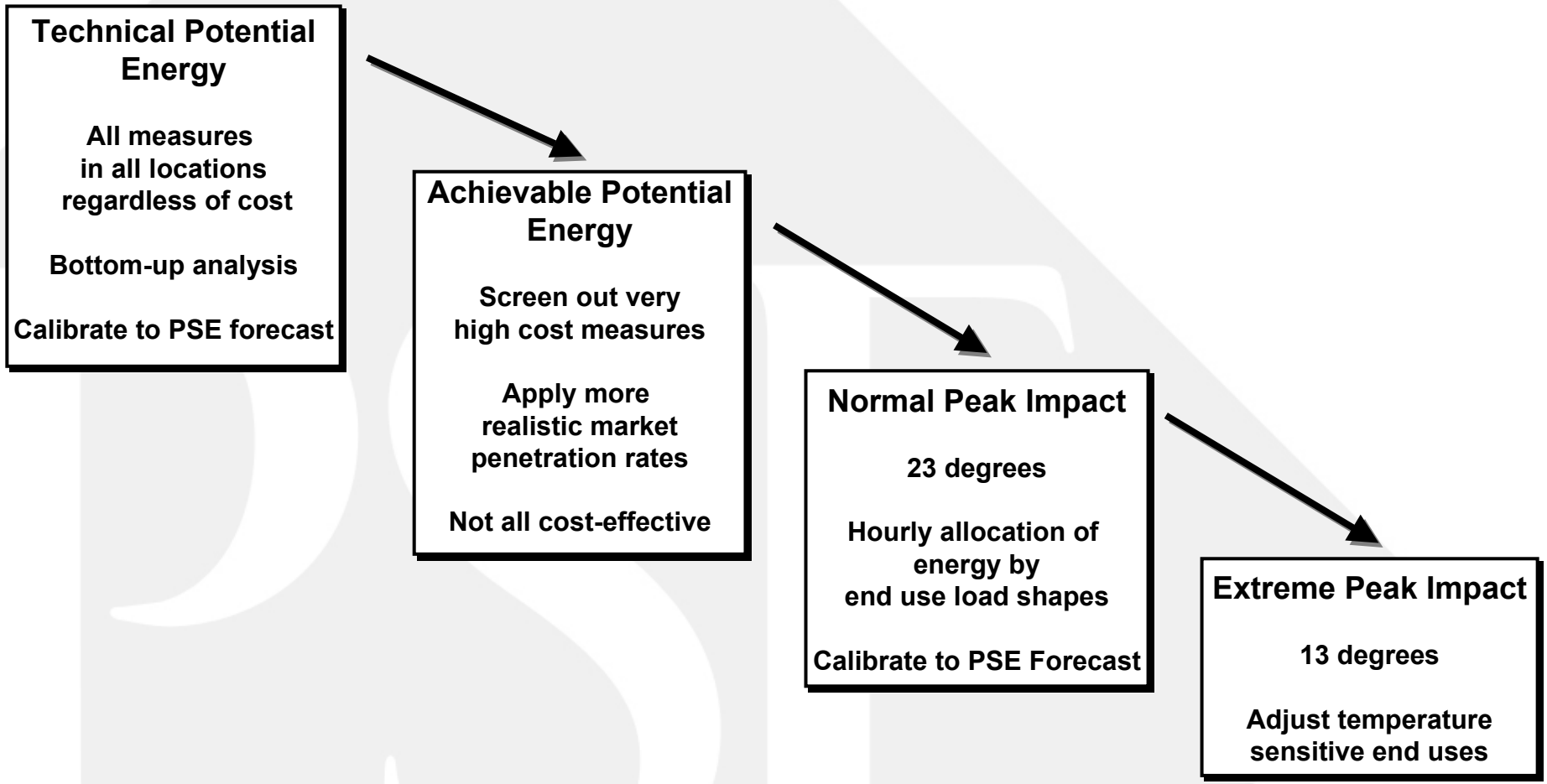
January 22, 2004

Overview

- Goal: Assess the conservation potential of Kitsap and Jefferson and counties, with particular emphasis on peak savings
- With the exception of four areas where county-specific data were available, all inputs and assumptions are identical to the 2003 PSE Least Cost Plan assessment
- Assessment focused on residential and commercial customers; excluding industrial

PSE PUGET SOUND ENERGY

Analytical Approach

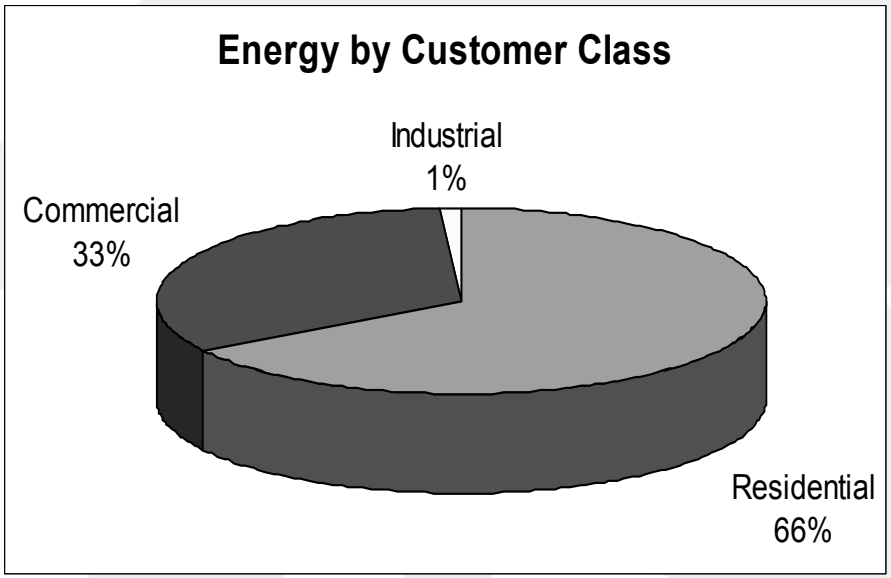


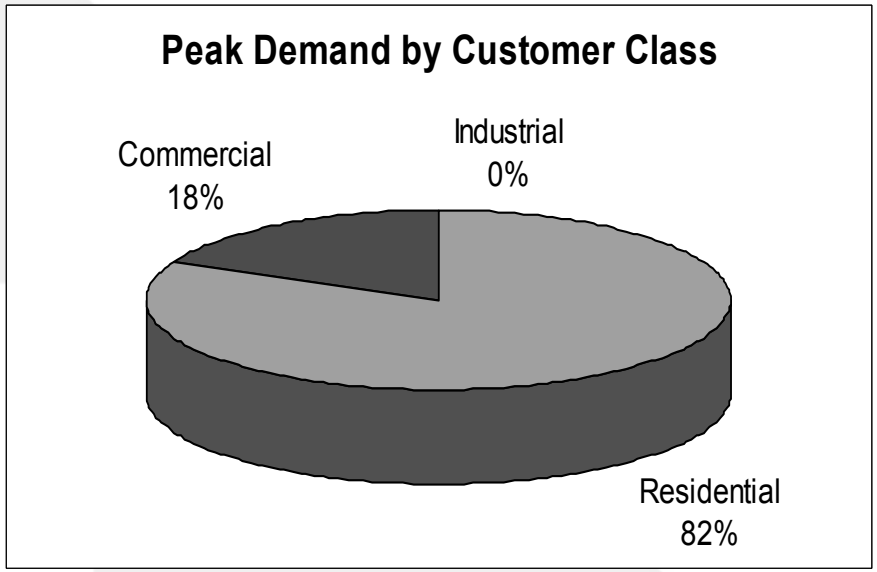
PSE PUGET SOUND ENERGY

Key Inputs

- **Customer and Load Forecasts**
  - PSE forecasts for Jefferson and Kitsap counties
  - Applies to both residential and commercial sectors
  - Customer counts key driver of potential
  - Load forecasts used to calibrate assessment and ensure reasonable results
- **End-Use Saturations and Fuel Shares**
  - Used county-specific data from 1999 Residential Energy Study and 1994 Commercial End-Use Survey
  - Comparison of Jefferson and Kitsap counties to rest of service territory
  - Changes made only where data were substantially different from PSE service area inputs used in LCP analysis

Load Forecast for Kitsap & Jefferson Counties

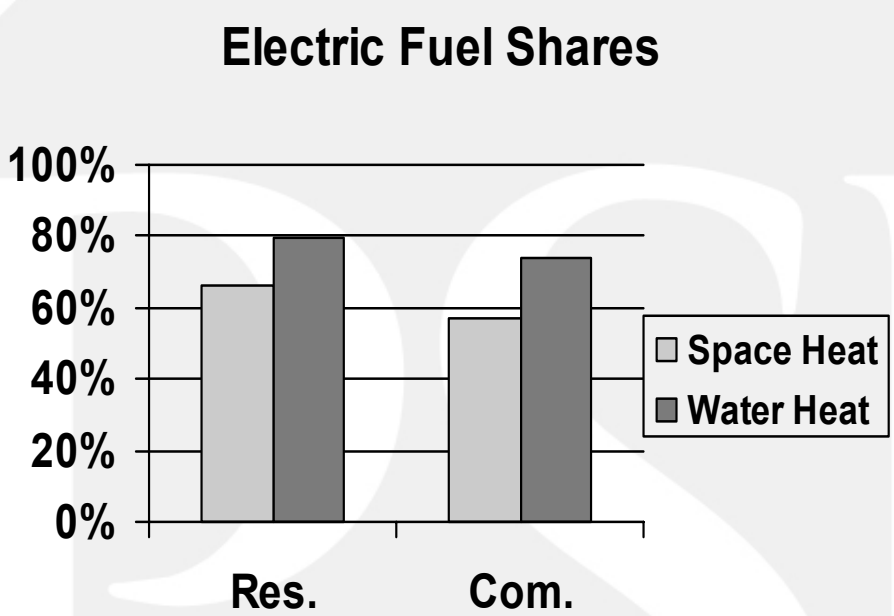


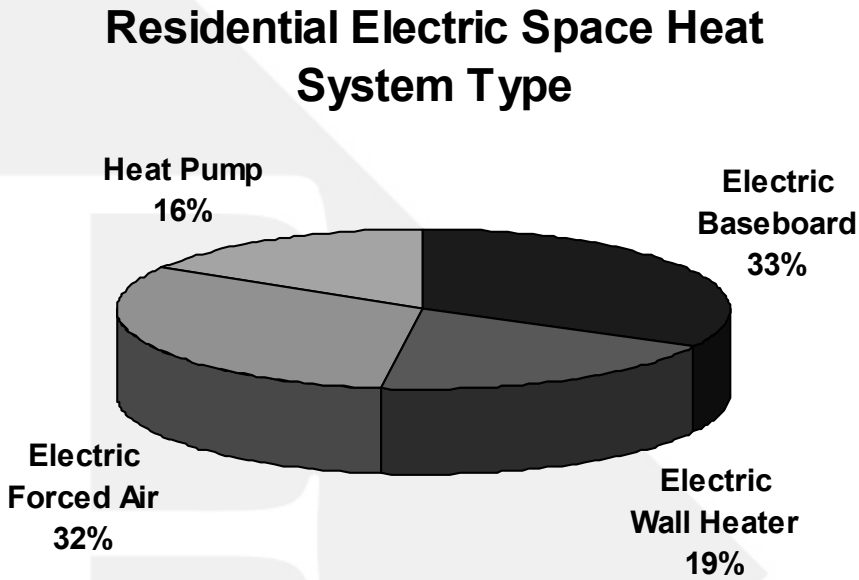


- **2007 Load**
  - **Energy: 2,247 GWh**
  - **Demand: 620 MW Normal; 682 MW Extreme**

PSE PUGET SOUND ENERGY

Fuel Shares for Kitsap & Jefferson Counties





PSE PUGET SOUND ENERGY

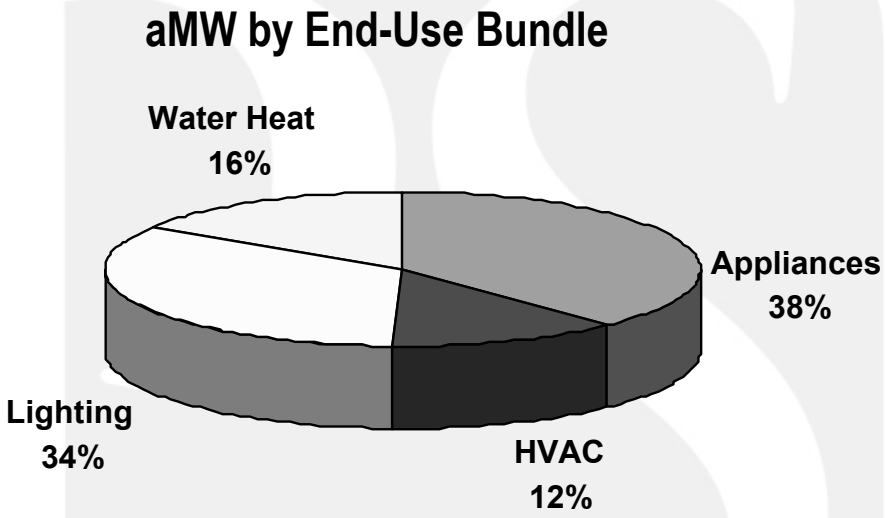
Electric Resource Bundles 20-Yr. Cumulative Achievable Savings by Sector

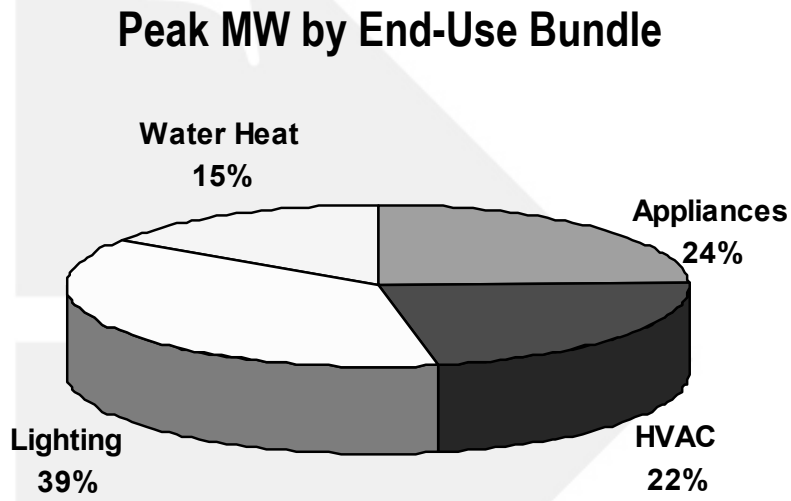
Sector	Vintage	End Use	20-Year Cumulative Energy Savings (aMW)	20-Year Cumulative 23° Peak MW Savings	20-Year Cumulative 13° Peak MW Savings	20-Year Cumulative Cost
Commercial	Existing	Appliances	0.16	0.16	0.16	$ 54,324
		HVAC	2.08	2.12	2.98	$ 846,096
		Lighting	6.85	5.44	5.44	$ 2,428,929
		Water Heat	0.06	0.06	0.06	$ 19,185
	New	Appliances	0.10	0.10	0.10	$ 30,227
		HVAC	1.51	1.55	2.18	$ 649,607
		Lighting	1.63	1.23	1.23	$ 379,857
		Water Heat	0.04	0.04	0.04	$ 13,114
		Commercial Subtotal	12.43	10.71	12.19	$ 4,421,341
Residential	Existing	Appliances	6.95	6.95	6.95	$ 3,454,078
		HVAC	2.50	7.06	10.23	$ 1,307,323
		Lighting	3.78	6.67	6.67	$ 1,567,090
		Water Heat	1.93	2.88	2.88	$ 756,183
	New	Appliances	0.87	0.87	0.87	$ 598,402
		HVAC	0.05	0.15	0.22	$ 29,739
		Lighting	3.11	5.49	5.49	$ 1,030,259
		Water Heat	1.34	1.99	1.99	$ 953,568
		Residential Subtotal	20.53	32.06	35.29	$ 9,696,642
COMBINED 20-YEAR TOTAL			32.96	42.77	47.49	$ 14,117,983
ANNUAL AVERAGE			1.65	2.14	2.37	$ 705,899

Costs based on full installed measure cost plus 15% program implementation cost

PSE PUGET SOUND ENERGY

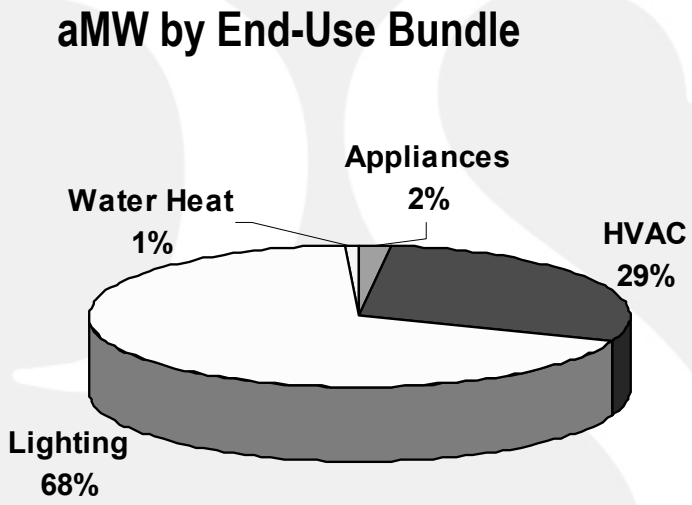
Summary of Results: Percent of Residential Electric Potential by End Use

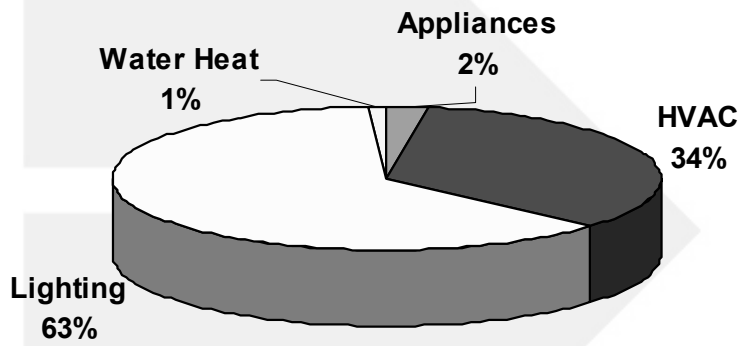




PSE PUGET SOUND ENERGY

Summary of Results: Percent of Commercial Electric Potential by End Use





PSE PUGET SOUND ENERGY

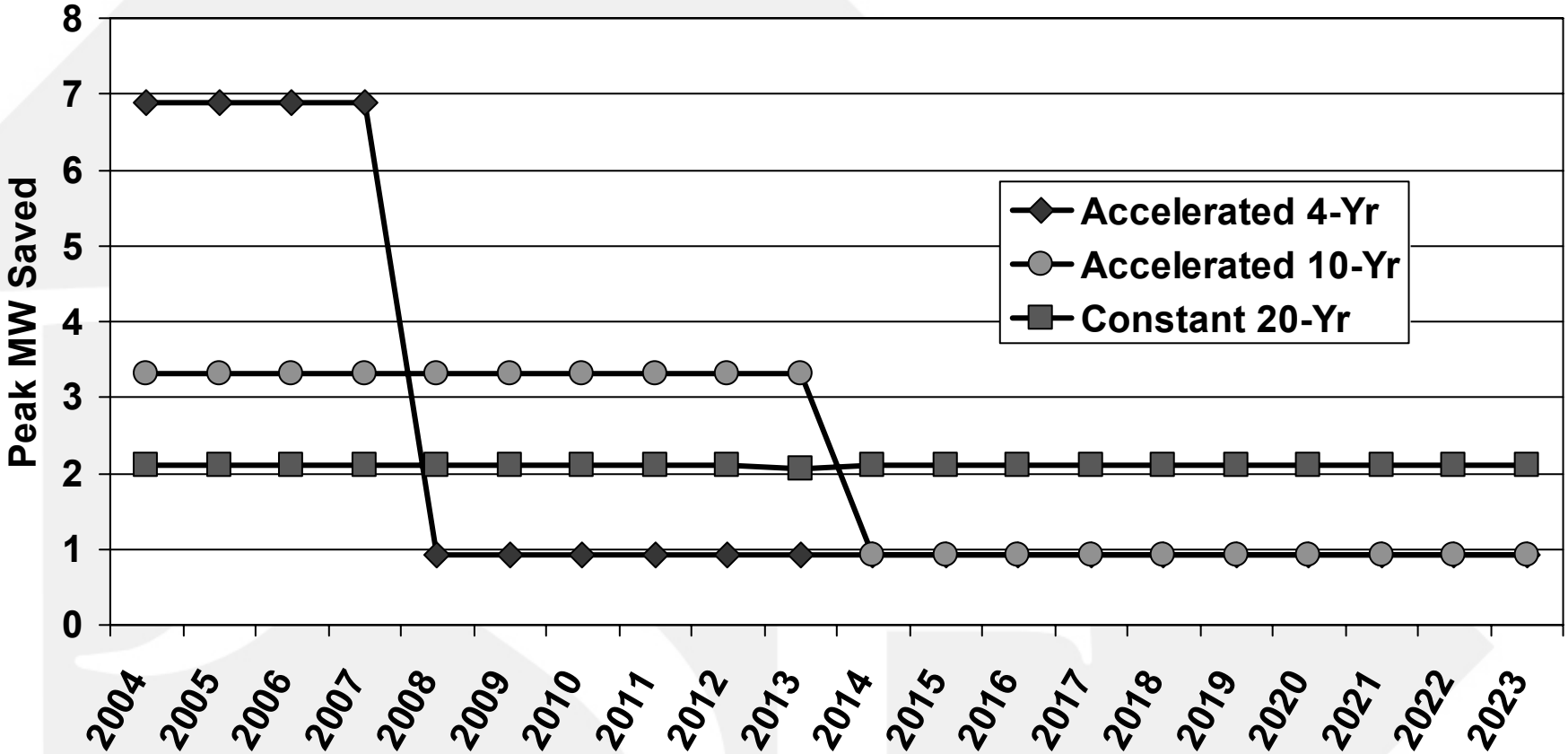
Accelerated Scenarios

- For existing construction, a portion of the potential is eligible for acceleration to look at short-term scenarios
- Measures eligible for accelerated scenario are based on retrofit
- Two acceleration scenarios: 10 years and 4 years

Sector	End Use	% of Potential for Existing Construction Eligible for Acceleration
Commercial	Appliances	16%
	HVAC	63%
	Lighting	100%
	Water Heat	100%
Residential	Appliances	21%
	HVAC	88%
	Lighting	100%
	Water Heat	100%

PSE PUGET SOUND ENERGY

Accelerated Peak Savings



PSE PUGET SOUND ENERGY

Implementation Issues

- 50% of 20-year potential is cost-effective to PSE
- 20-year potential assumes all measures with shorter lives are replaced
- Potential assumes costs are not a barrier to customers (equivalent to 100% subsidy)
- Acceleration requires high-saturation direct installation campaign at significantly higher costs
- Resources not in place or available
- Considerable analysis and planning needed before targeted programs could start

PSE PUGET SOUND ENERGY

Appendix

PUGET SOUND ENERGY

Accelerated Peak Savings in 2007 -- 10-Year Scenario

- Based on acceleration of all eligible energy savings over 10 years, the percentage of savings acquired in the fourth year was applied to the 20-year peak savings to assess peak MW potential by 2007

Sector	Vintage	End-Use Bundle	MW Potential 2007		aMW 2007
			23° Peak	13° Peak	
Commercial	Existing	Appliances	0.037	0.037	0.0361
		HVAC	0.692	0.973	0.6792
		Lighting	2.176	2.176	2.7395
		Water Heat	0.026	0.026	0.0255
		Subtotal	2.930	3.211	3.4802
	New	Appliances	0.020	0.020	0.0201
		HVAC	0.310	0.436	0.3057
		Lighting	0.246	0.246	0.3295
		Water Heat	0.009	0.009	0.0088
		Subtotal	0.585	0.711	0.6640
	Combined	Total	3.516	3.922	4.1443
Residential	Existing	Appliances	1.685	1.685	1.6850
		HVAC	2.655	3.845	0.9401
		Lighting	2.669	2.669	1.5111
		Water Heat	1.150	1.150	0.7737
		Subtotal	8.160	9.349	4.9099
	New	Appliances	0.174	0.174	0.1737
		HVAC	0.030	0.043	0.0106
		Lighting	1.098	1.098	0.6217
		Water Heat	0.399	0.399	0.2682
		Subtotal	1.701	1.714	1.0742
	Combined	Total	9.860	11.063	5.9841
		Total	13.376	14.985	10.1284

PUGET SOUND ENERGY

Accelerated Peak Savings in 2007 -- 4-Year Scenario

- Based on accelerating all eligible energy savings over 4 years, the percentage of savings acquired by the fourth year was applied to the 20-year peak savings to assess peak MW potential by 2007

Sector	Vintage	End-Use Bundle	MW Potential 2007		aMW 2007
			23° Peak	13° Peak	
Commercial	Existing	Appliances	0.052	0.052	0.051
		HVAC	1.498	2.106	1.470
		Lighting	5.439	5.439	6.849
		Water Heat	0.064	0.064	0.064
		Subtotal	7.053	7.661	8.433
	New	Appliances	0.020	0.020	0.020
		HVAC	0.310	0.436	0.303
		Lighting	0.246	0.246	0.326
		Water Heat	0.009	0.009	0.009
		Subtotal	0.585	0.711	0.657
	Combined	Total	7.639	8.372	9.090
Residential	Existing	Appliances	2.572	2.572	2.572
		HVAC	6.383	9.242	2.260
		Lighting	6.673	6.673	3.778
		Water Heat	2.875	2.875	1.934
		Subtotal	18.503	21.363	10.544
	New	Appliances	0.174	0.174	0.174
		HVAC	0.030	0.043	0.011
		Lighting	1.098	1.098	0.622
		Water Heat	0.399	0.399	0.268
		Subtotal	1.701	1.714	1.074
	Combined	Total	20.204	23.077	11.618
		Total	27.842	31.448	20.708

PUGET SOUND ENERGY